Factors Characterizing Reopened Issues: A Case Study

ABSTRACT
Background: Reopened issues may cause problems in managing software maintenance effort. In order to take actions that will reduce the likelihood of issue reopening the possible causes of bug reopens should be analysed.

Aims: In this paper, we investigate potential factors that may cause issue reopening.

Method: We have extracted issue activity data from a large release of an enterprise software product. We consider four dimensions, namely developer activity, issue proximity network, static code metrics of the source code changed to fix an issue, issue reports and fixes as possible factors that may cause issue reopening. We have done exploratory analysis on data. We build logistic regression models on data in order to identify key factors leading issue reopening. We have also conducted a survey regarding these factors with the QA Team of the product and interpreted the results.

Results: Our results indicate that centrality in the issue proximity network and developer activity are important factors in issue reopening. We have also interpreted our results with the QA Team to point out potential implications for practitioners.

Conclusions: Quantitative findings of our study suggest that issue complexity and developers workload play an important role in triggering issue reopening.

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PROMISE '12, September 21–22, 2012, Lund, Sweden